

Name



Certificate III in Offsite Construction (Shopfitting) Course No. 8121/2

Block 1

Student Guide N° 1

BASIC HAND TOOLS AND OHS

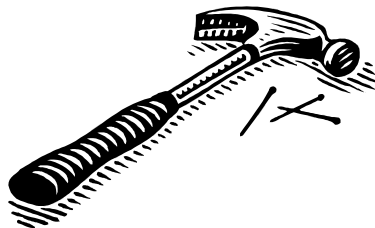


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BASIC HAND TOOLS AND OHS

Task Complete

1. **THE BUILDING INDUSTRY;** Read pages 57 to 73 of “Basic Building and Construction Skills” edition 3 and complete the self test questions in exercise 1 on page 18 of this hand out. Other reference sources:
 - a. www.nswshopfitting.wikispaces.com
 - b. [Construction online resources](#)☐

2. **BASIC HAND TOOLS;** Read Chapter 8 of “Basic Building and construction Skills” edition 3 and complete the self test questions in exercises 2 and 3 on page 18 - 19 of this hand out. Other reference sources.
 - a. Basic tools section on : [Year1Shopfitting » Basic Hand Tools](#) and download CARP02/1 document
 - b. [Construction online resources](#)☐

3. **OCCUPATIONAL HEALTH SAFETY;** Read the *Summary of the Occupational Health & Safety Act 2000* and and Chapter 1 of “Basic Building and Construction Skills” edition 3 and complete the self test questions in exercises 4 and 5 on page 21 - 22 of this handout. Other reference sources:
 - a. [Year1Shopfitting » OHS Summary](#)
 - b. [WorkCover NSW - Summary of OHS 2000 Act](#)☐

4. **WORK METHOD STATEMENTS;** Read the fact sheets on the following pages. This will help you to complete assessment tasks given during the attendance block.☐
 - a. WorkCover NSW – Subby pack – http://www.workcover.nsw.gov.au/NR/rdonlyres/5103894D-1E5A-4438-B1CE-4DD533E4CBDC/0/gen_subbypack_975.pdf
 - b. [Year 1 Shopfitting Wikispace - http://year1shopfitting.wikispaces.com](#)

5. **BASIC TRADE CALCULATIONS;** Read Off-Site Construction, Furniture, Glass and Glazing Material Calculations and Costing (OSFGG07), Section 1: Basic Trade Calculations and Chapter 5 of “Basic Building and Construction Skills” edition 3 and formula sheets attached. Complete the self test questions in exercise 6 on page 24 ☐

Required text books:

TAFE NSW, 2007, *Off-Site Construction, Furniture, Glass & Glazing Material Calculations & Costing (Osfgg07/1)*, TAFE NSW Resource Distribution Centre, Yagoona, Sydney (RRP \$30.38)

TAFE NSW, SWSI, and Pearson Education, 2004, *Basic Building and Construction Skills*, 3rd ed. Pearson Education, French’s Forest, Sydney (RRP \$41.95)

Available from your **College Bookshop**

Other resources:

- Barrington, J, Mylius, D and Arden, S, (2002) *Book 1 Practical Australian Carpentry – Framing and Construction*, WCB/McGraw-Hill, Sydney.
- Barrington, J, Mylius, D and Arden, S, (2002) *Book 2 Practical Australian Carpentry – Joinery and Advanced Framing*, WCB/McGraw-Hill, Sydney.

Websites Addresses:

Construction online resources:

Common units: http://onlinedev.illawarra.tafensw.edu.au/08002_commonCore4/index.htm

Carpentry units: http://onlinedev.illawarra.tafensw.edu.au/08001_carpentry5/index.htm

Offsite Construction Websites: <http://www.nswshopfitting.wikispaces.com>

This Package addresses **in part** the following units of competency:

| | | |
|----------|---|-------------------------------------|
| BCG1000A | Carry out interactive workplace communication | |
| 1. | Gather, convey and receive information | <input type="checkbox"/> |
| 2. | Carry out face-to-face routine communication | <input checked="" type="checkbox"/> |
| 3. | Apply visual communications | <input checked="" type="checkbox"/> |
| 4. | Participate in simple on site meeting processes | <input type="checkbox"/> |
| BCG1001A | Carry out OH&S requirements | |
| 1. | Follow safe work practices | <input type="checkbox"/> |
| 2. | Assess risks | <input checked="" type="checkbox"/> |
| 3. | Follow emergency procedures | <input checked="" type="checkbox"/> |
| BCG1002A | Plan and organise work | |
| 1. | Plan and prepare | <input checked="" type="checkbox"/> |
| 2. | Sequence work safely | <input checked="" type="checkbox"/> |
| 3. | Clean up | <input type="checkbox"/> |
| BCG1004A | Carry out measurements and calculations | |
| 1. | Obtain measurements | <input type="checkbox"/> |
| 2. | Perform simple calculations | <input checked="" type="checkbox"/> |
| 3. | Estimate approximate quantities | <input checked="" type="checkbox"/> |
| BCG1005A | Use hand and power tools | |
| 1. | Plan and prepare | <input type="checkbox"/> |
| 2. | Identify and select hand, power and pneumatic tools | <input checked="" type="checkbox"/> |
| 3. | Use tools | <input type="checkbox"/> |
| 4. | Clean up | <input type="checkbox"/> |

FACT SHEET

WORK METHOD STATEMENTS (Source [Workcover NSW](#))

A Work Method Statement requires the work method to be presented in a logical sequence. The hazards associated with each process are to be identified, and the measures for controlling these hazards specified.

Any job, no matter how complex, can be broken down into a series of basic jib steps that will permit a systematic critical examination to be made of each part of the job for hazards and potential accidents. The description of the process should not be too broad as this omits activities with the potential to cause accidents and prevents proper identification of the hazards, not is it necessary to provide too fine a detail of the tasks.

Consider the overall job in the six basic steps as shown below and then prepare a detailed statement, addressing all tasks and risks.

| | |
|---|--|
| 1 | Make is safe: safety/skills training, licenses, permits, job analysis/planning, lockout/tagout |
| 2 | Get it ready: signage, barricades, ventilation, lighting, materials, equipment, tools, etc. |
| 3 | Do this first: initial process/preparatory works |
| 4 | Do this next: the process/es in logical sequence(s) |
| 5 | Make it secure: inspect, test, secure works, lockout/tagout, etc. |
| 6 | Cleanup/put away: surplus materials, waste recycling, equipment, tools, etc. |

A "hazard" may be either intrinsic or inherent, existing or potential, an unsafe condition and/or an unsafe act - ie. a dangerous location, an unsafe (hazardous) work process, or a potentially hazardous task as a stage of the construction work process.

Hazard Identification

- (a) Safety audit
- (b) Workplace inspections
- (c) Accident investigations
- (d) Consultation
- (e) Injury and illness records
- (f) Health and environment monitoring
- (g) Complaints
- (h) Observation

Hazard Assessment

Once hazards have been identified, you can then assess their significance. The level of significance will determine the priority assigned to its elimination or control. There are many types of hazard – physical, chemical and biological for example. A few general points need to be considered, however, when assessing hazards.

- More than one cause. There may well be a number of factors which contribute to the probability and degree of injury or illness for a particular hazard.
- Exposure. The significance of the risk of injury or illness may be affected by the level of a worker's exposure to a hazard.

- **Severity.** This concerns the extent of the injury or degree of harm which might be caused by a hazard.
- **Human differences.** Hazards assessed in terms of the individual or groups of employees who are exposed to them. Their skills, experience, training and physical capabilities must be taken into account

The "**Hierarchy of control measures**" is the recommended procedure for Hazard Control, with personal protective equipment (PPE) the least preferred. In some situations a combination of control measures may need to be used. References to legislation, codes of practice or Australian Standard is not an acceptable alternative for Hazard Control or Risk Management; the actual procedure or control must be documented.

HIERARCHY OF HAZARD CONTROLS

Hazard Control

In many cases a range of control methods must be used to control hazards. Following are various strategies which should be considered. They are listed in order of preference. These types of strategies should be used where possible because they are less subject to human failure and because they are less disruptive and uncomfortable for people working in the area. Whichever method you use, remember that in each case the effectiveness of the controls should be monitored regularly.

Engineering controls

- 1.**Design.** Try to ensure that hazards are "designed out" when new materials, equipment and work systems are being planned for the workplace.
- 2.**Eliminate the hazard** or substitute less hazardous materials, equipment or substances.
- 3.**Change the process**, alterations to tools, equipment or work systems can often make them much safer.
- 4.**Enclose or isolate the process** for example, through the use of guards or remote handling techniques.
- 5.**Provide effective ventilation**, through local or general exhaust ventilation systems.

Other controls

6. Provide training on hazards and safe working procedures.
7. Establish routine housekeeping and maintenance procedures.
8. Provide suitable and properly maintained personal protective equipment and training in its use.
9. Establish suitable administrative procedures such as job rotation to reduce exposure or timing the job so that fewer workers are exposed

Work Method Statement

Consider the overall job in the six basic steps and as shown below and then prepare a detailed statement, addressing all tasks and risks.

| | | |
|---|----------------------------|--|
| 1 | Make is safe | Safety/skills training, licenses, permits, job analysis/planning, lockout/tagout |
| 2 | Get it ready | Signage, barricades, ventilation, lighting, materials, equipment, tools, etc. |
| 3 | Do this first | Initial process/preparatory works |
| 4 | Do this next | The process/es in logical sequence(s) |
| 5 | Make it secure | Inspect, test, secure works, lockout / tag out, etc |
| 6 | Clean up / put away | Surplus materials, waste recycling, equipment, tools, etc. |

The WMS must nominate

| | |
|---|--|
| 1 | The occupation and the number of employees required to safely do the task(s) involved. |
| 2 | Safety and/or skills training provided or required to be completed prior to commencing work is to be identified, together with any special qualifications, permits, licenses, certificates of competency required by the employees and/or statutory regulations. |
| 3 | Copies of such documents and training records are to be provided with the WMS |
| 4 | Specify the type/capacity and description of the mechanical aids, plant and mobile equipment that is to be used in the construction work process. |
| 5 | Members of the workforce should be involved/consulted in the development of any WMS, and the employees are required to signify their acceptance and understanding of the WMS by signing on the last page of the WMS. |
| 6 | The site safety induction should ensure the formwork contractor's employees understanding of the WMS by a suitable verification process |

**Identify
Assess
Control**

**Monitor
Evaluate
Review**

7.1 GUIDELINES FOR PRODUCING WORK METHOD STATEMENTS

The following information has been developed as a guide for producing WMS's. Individual method statements will vary depending on the nature of the tasks and risks that are present. Accordingly, the emphasis on any one of the headings below will vary on the nature of the job. For instance, if the work involved is working adjacent to a public thoroughfare, considerable details will be required under the appropriate heading.

The WorkCover Authority has available Codes of Practice and requirements for various operations. It is essential that any WMS's are prepared in context with the background information available in those documents. Also, the Authority advises:

"Codes of Practice should be followed, unless there is an alternative course of action which achieves the same or better standard of health and safety in the workplace."

Identification of Hazards and **Risk Assessment** should be performed prior to developing a WMS. Any or all control measures identified must be included under the relevant heading.

1. **Description**

WMS's should contain a brief description of the scope of the works and tasks to be performed. Also, the name and location of the project should be included. The experience and qualifications of the personnel involved may also be included under this heading.

2. **Supervision**

Where personnel require supervision to carry out the tasks, the name, qualifications and experience of the supervisor should be noted.

3. **Hours of Work**

Hours of work of the job and duration should be nominated. Any work that is carried out after normal working hours. Consideration may have to be given to such things as first aid, lighting, local council restrictions on noise.

4. **Training and Information**

Any specific training/information required by personnel carrying out a task as part of a WMS. It is advisable that all personnel involved in the task be issued with a copy of the WMS.

5. **Access**

The means of access to the work areas should be noted in the WMS.

6. **Safety of Public/Visitors**

Where other Persons or the public are likely to be at risk because of the tasks being carried out, a detailed description of methods used to isolate or protect the persons concerned.

7. **Fire Prevention**

Any requirements for fire prevention by relevant authorities and/or Builder/client, should be complied with and noted in the statement.

8. **Work Areas**

Details of the specific area where the works are to be performed should be included. Provision for ensuring the safety of personnel where they could fall more than 1.8 metres **must** be included. This may involve persons working from scaffolding. If so, provide details/description of the type of scaffolding that is to be erected.

9. **Materials Handling**

Details of the method and/or equipment to be used to handle materials used in the tasks.

10. **Removal of Rubbish and Excess Materials**

Details of the method and/or equipment to be used to remove rubbish should be included.

11. **Engineers Details**

Where any task involves subjecting floor slabs, awnings etc, to loads other than which they are designed, i.e. erecting scaffolds on awnings, earth moving machinery on suspended concrete floors, then statements/certificates from appropriate qualified engineer should be included.

12. **Personal Protective Equipment (PPE)**

Any PPE that is to be used should be detailed. For instance if safety harnesses to be used, then the type should be specified and its compliance to the relevant Australian Standard. Also, any training required in the use of PPE should be noted.

13. **The Task**

A step by step procedure describing each part of the operation to be carried out by personnel. All details of the equipment/tools should also be included.

14. **Additional Information**

Any information not covered by this guideline that is relevant to the works should be noted. Such as, hazardous chemicals or isolating electrical hazards.

15. **Additional Work Method Statements/Variations**

An additional WMS may be required if substantial variation is required as a result of changes in conditions or location. An example of a WMS is attached.

Sample risk assessment form and work method statement are provided on the following pages. Your trainer will lead you in filling out these samples.

Please note that work in Joinery Shops may require different documentation but the basics are the same. Because of the sometimes repetitive nature of some form of works it is critical that Safe Work Method Statements are available and form an integral part of any workshop induction program. A further sample of a completed form can be found in Chapter 1 of the *Basic Building and Construction Skills*, 3rd ed. Page 32.

NOTE: If the work is considered **LOW** risk in a risk assessment a **SWMS** is not essential, however it is good practice to ensure a SWMS is prepared for all work and is supported by Safe Operating Procedure (**SOP's**) documents for all static machines. Material Safety Data Sheets (**MSDS**) also provide critical safety information in a quality control/improvement cycle.

| RISK ASSESSMENT | | | |
|---|---------------|--------------------------|---|
| <i>RISK</i> | <i>AFFECT</i> | <i>RISK CLASS RATING</i> | <i>ACTION REQUIRED</i> |
| The hazard has the potential to kill or permanently disable you | High Risk | 1 | SWMS must be completed |
| The hazard has the potential to cause you serious injury or illness that will temporarily disable you | Medium Risk | 2 | SWMS must be completed |
| The hazard has the potential to cause a minor injury that will not disable you | Low Risk | 3 | A SWMS is not required – however – action must be taken to minimise the risk as far as possible |

Please identify the risk involved and place the rating number in the “Rating” Column on page 1. The numbers show you how important it is to do something.

Environmental risks are to be listed on page 1 but a rating is not required for these risks.

| | | | |
|---|---|---|--|
| Provide a description of what training is given to people involved with the work | <i>Site Induction, Instruction on wearing of Personal Protective Equipment, MSDS controls and recommendations, manual handling training</i> | | |
| List the names and qualifications of those responsible for training them | Team leader / Supervisor – Line supervisor training, manual handling training | | |
| Identify the plant and equipment that will most likely be used on site eg. ladders, scaffolds, grinders, electrical leads, welding machines, fire extinguishers, manual handling aids ↓ | List the details of the inspection and maintenance checks that will be or have been carried out on the plant and equipment ↓ | Signatures of staff who have read and understand the work activities described in the Safe Work Method Statement ↓ | |
| Electrical plant, leads and ELCBs | Currently tested and tagged. Visual inspection prior to use. | | |
| Fire extinguisher | Annual inspection | | |
| | | | |
| | | | |
| List the names of person(s) responsible for supervising/inspecting work ↓ | | | |
| Person(s) responsible for site supervision of the work, inspecting and approving work areas, compliance with SWMS, protective measures, plant, equipment and power tools Name: _____ Position: _____ Signature: _____ | | | |

Your teacher will demonstrate how these forms are to be completed

SAMPLE - SAFE WORK METHOD STATEMENT FORM

| | | | | |
|---|---|----------------------|---|--|
| Insert name of College➔ | | | REPRESENTATIVE RESPONSIBLE FOR PREPARATION OF THE SAFE WORK METHOD STATEMENT AND THE DATE SIGNED Signature_____ Date _____/_____/_____ *Eg. Supervisor | |
| Description of the work to be undertaken➔ | Joinery Shop Work | Work Site / Office ➔ | | |
| Step by step sequence involved in doing the work ↓ (attach additional page if more room is needed to list steps) | Risk and rating for each step ↓ Safety / Environmental Risk Rating | | Safety Controls that will be in place to minimise these hazards/risks ↓ NOTE. Mandatory personal protective equipment including UV protective clothing, boots and helmets are not included in the following Controls but are required on all sites in accordance with DPWS policy. | |
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Certificate III in Offsite Construction (Shopfitting) - Course No. 8121
Skills Cluster - BCG1000A, BCG1001A, BCG1002A, BCG1004A, BCG1005A,

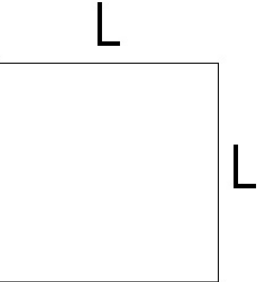
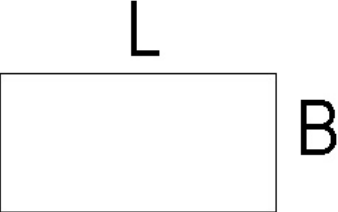
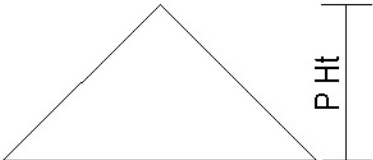
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|--|--|--|--|
| JOB SPECIFIC REQUIREMENTS | | | |
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| | | | |
| Codes of Practice, Legislation, Standards applicable to the work and details of where these are kept ➔ | Material Safety Data Sheets located on site. Code of Practice: Electrical Practices for Construction Work at Properties & Environment Unit. NSW Hazardous Substances Regulations, NSW Manual Handling Regulations, OHS Act 2000 with Manager OHS | | |

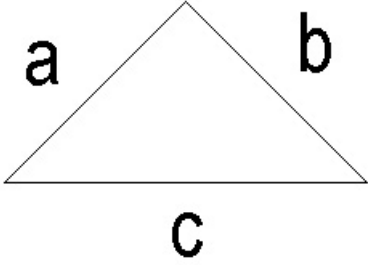
Section 3 – BASIC MEASUREMENTS & CALCULATIONS

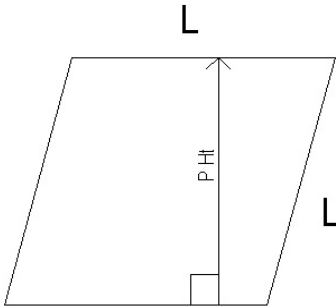
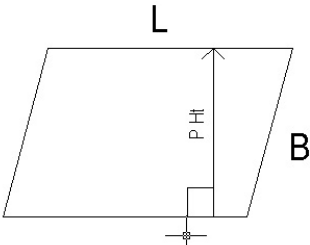
Your trainer will refer you to the *Off-Site Construction, Furniture, Glass & Glazing Material Calculations & Costing (Osfgg07/1)* textbook for other exercises and assistance.

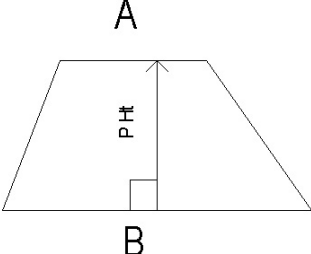
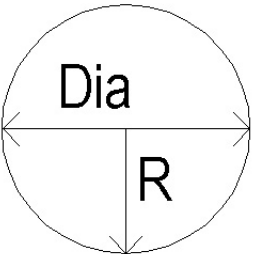
Below are the common formulae we use in the Offsite construction industry for working out quantities

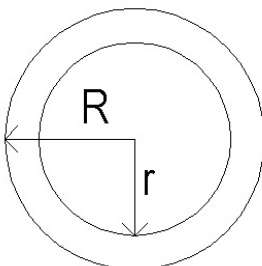
STANDARD FORMULA SHEETS

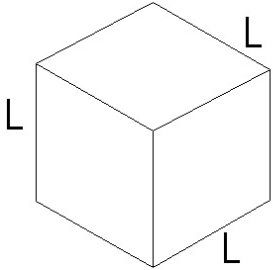
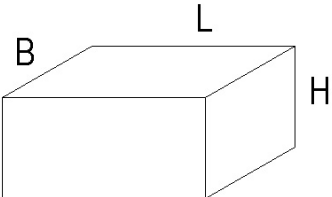
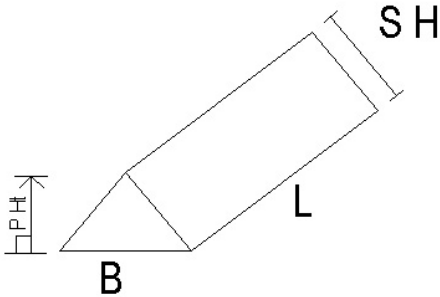
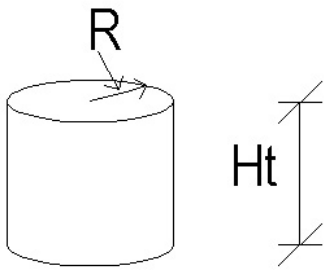
| Plane Figure | Area | Perimeter |
|--|--|------------------------------------|
|  <p>SQUARE</p> | $L \times L$ OR L^2 | $4 \times L$ |
|  <p>RECTANGLE</p> | $L \times B$ | $2 L + 2 B$ OR $2 (L + B)$ |
|  <p>TRIANGLE</p> | $\frac{1}{2} B \times PHt$ or $\frac{B \times PHt}{2}$ | |

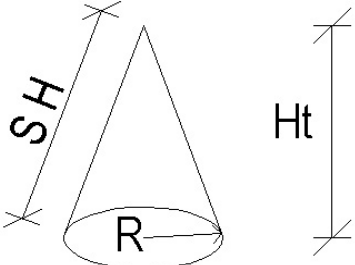
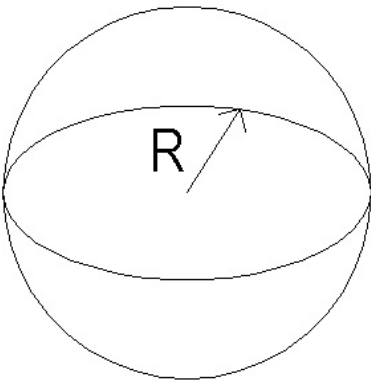
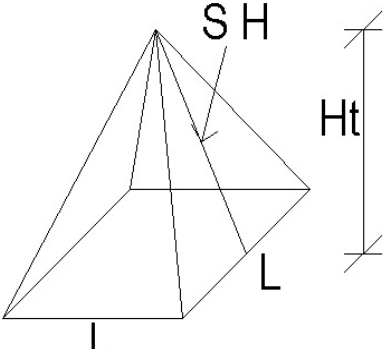
| | | |
|--|---|-----------------|
|  <p style="text-align: center;">TRIANGLE</p> | $\sqrt{S(S-a)(S-b)(S-c)}$ <p style="text-align: center;">Where</p> $S = \frac{\text{Perimeter}}{2}$ | $S = a + b + c$ |
|--|---|-----------------|

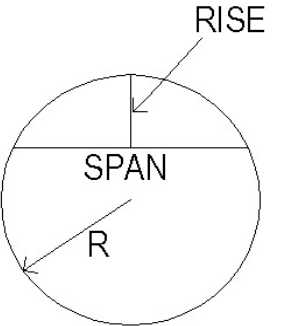
| Plane Figure | Area | Perimeter |
|---|---|--|
|  <p style="text-align: center;">RHOMBUS</p> | $L = P \times Ht$ | $4 \times L$ |
|  <p style="text-align: center;">PARALLELOGRAM or RHOMBOID</p> | $L = P \times Ht$ | $2L + 2B$ <p style="text-align: center;">or</p> $2(L + B)$ |
| | $\frac{1}{2} (A + B) \times P.Ht$ <p style="text-align: center;">or</p> | |

| | | |
|--|--|------------------------------------|
|  <p>TRAPEZIUM</p> | $\frac{(A + B)}{2} \times PHt$ | |
|  <p>CIRCLE</p> | <p>For reference the value of $\pi = 3.14159$</p> πR^2 | $C = \pi D$ <p>Or</p> $C = 2\pi R$ |

| Plane Figure | Area | Perimeter |
|--|--|-----------|
|  <p>ANNULUS</p> | $\pi R^2 - \pi r^2$ <p>or</p> $\pi \{(R-r)(R+r)\}$ | |

| Solid | Volume | Surface area |
|--|--|--|
|  <p>CUBE</p> | $L \times L \times L$ or L^3 | $6 L^2$ |
|  <p>RECTANGULAR PRISM</p> | $L \times B \times H$ | $2 (LB+BH+HL)$ |
|  <p>TRIANGULAR PRISM</p> | $(\frac{1}{2} B \times PHt)L$ | $2(\frac{1}{2}B \times PHt)+2(L+SH)+(L \times B)$ |
|  <p>CYLINDER</p> | $\pi R^2 H$ | Curved = $\pi D \times H$ Total = $\pi D H \times 2 \pi R^2$ |

| Solid | Volume | Surface area |
|---|---|--|
|  <p>CONE</p> | $\frac{1}{3}\pi R^2 H$ | <p>Curved Surface</p> $\pi R \times SH$ |
|  <p>SPHERE</p> | $\frac{4}{3}\pi R^3$ or $\frac{1}{6} \pi D^3$ | $4\pi R^2$ or πD^2 |
|  <p>SQUARE PYRAMID</p> | $\frac{1}{3}L^2 Ht$ | <p><i>Slant Surface</i></p> $\frac{L}{2} SH$ <p>Area of triangle</p> $\frac{1}{2} \text{ base} \times Ht$ |

| | |
|---|---|
|  <p>SEGMENTAL ARCH</p> | $R = \frac{(\text{Half Span})^2 + \text{Rise}}{2 \text{ Rise}}$ |
|---|---|

Section 4 - Exercises

Name.....

THE BUILDING INDUSTRY

EXERCISE 1

1. Where would you find conditions of employment defined, such as minimum wages, hours of work, overtime, sick leave and other conditions?
Tick the correct response
 - TAFE Handbook
 - Newspapers
 - Occupational Health and Safety Act
 - An Award
2. Industrial trade unions are responsible for the welfare of all parties in the construction industry. True or False?
3. List the three main sections of the construction industry:
 - (a)
 - (b)
 - (c)
4. On a large commercial / industrial site who would be expected to organise the day-to-day running of the site:
 - Project Manager
 - General Foreperson
 - Sub-contractor
 - Tradesperson
5. There will be a waste of time, money and materials without careful?
6. General home construction falls under which industry skill stream?
 - Civil Operations
 - General Construction
 - Heavy Engineering
 - Services
 - Off-Site

Name.....

BASIC HAND TOOLS

EXERCISE 2

1. Which of the following tools are used for measuring and marking?
 - plane
 - four-fold rule
 - g-clamp
 - handsaw
 - cold chisel
 - combination square
 - hammer
 - marking gauge
 - tape measure
2. What tool might you use to clamp up a wide job?
3. Saws are classified as what type of tool?
4. Why do we not start chiselling on set-out lines?
5. What tool is designed for striking chisels and knocking frames together in a workshop?
6. What is the most useful hammer for a carpenter?
7. Tools should be stored safely in a box?

Name.....

CUTTING AND BORING TOOLS

EXERCISE 3

1. When grinding plane blades the angle should be approximately to to the face.
2. Oilstones may be divided into two main groupsstone andstone.
3. Under no circumstances should there be an angle on the back flat side of a plane iron or chisel. True or False?
4. When sharpening a handsaw what tool is used to create the saw kerf?
5. Which of the following planes is designed for planing end grain?
 - Duplex rebate plane
 - Block plane
 - Spokeshaves
 - Plough plane
6. What is the name of a small boring tool designed for making small pilot holes for screws or nails to prevent splitting of timber?

Name.....

OCCUPATIONAL HEALTH & SAFETY

Resource : http://www.austlii.edu.au/au/legis/nsw/consol_reg/ohasr2001364/

EXERCISE 4

1. Name the New South Wales Act of Parliament that governs occupational health and safety at work.

2. What does the Act aim to do?

3. List 5 things and employer must do to ensure the Health, safety and Welfare of their employees.

a)

b)

c)

d)

e)

4. What duties does an employee have in relation to the Act?

5. When can an OHS committee be established in a workplace?

6. The ACT outlines penalties for non compliance. What is the maximum penalty for an individual under the ACT?

Penalty Units _____

Dollars \$ _____

Name.....

OCCUPATIONAL HEALTH & SAFETY

EXERCISE 5

1. What is the aim of the Occupational Health & Safety Regulations 2001?

2. The Regulation has penalty levels which apply throughout. What is the maximum fine for each level (using current rate)?

Level 1 _____ Penalty Units

\$ _____

Level 2 _____ Penalty Units

\$ _____

Level 3 _____ Penalty Units

\$ _____

Level 4 _____ Penalty Units

\$ _____

3. List and describe the steps used to 'control' risks, in the correct order.

a)

b)

c)

d)

e)

4. If an employer can not eliminate a risk, what must he or she do?

5. Who is the person responsible for identifying hazards in the workplace?

Name.....

BASIC TRADE CALCULATIONS

EXERCISE 6

1. Using the examples below, convert the following measurements from millimeters to metres and metres to millimeters, as shown:

| Convert from millimeters to metres | | | |
|------------------------------------|---|--|---|
| 745 mm | = | | m |
| 107250 mm | = | | m |
| 50248 mm | = | | m |
| 3 mm | = | | m |
| 67 mm | = | | m |
| 128 mm | = | | m |
| 7002 mm | = | | m |
| 22045 mm | = | | m |
| 556 mm | = | | m |
| 33333 mm | = | | m |

| Convert from metres to millimeters | | | |
|------------------------------------|---|--|----|
| 6.0 | m | | mm |
| 536.45 | m | | mm |
| 27.01 | m | | mm |
| 0.052 | m | | mm |
| 54.029 | m | | mm |
| 0.002 | m | | mm |
| 9.6 | m | | mm |
| 11.08 | m | | mm |
| 457.02 | m | | mm |
| 3.44 | m | | mm |

| 100's of mm in m | 10's of mm in m | Individual mm in m |
|------------------|-----------------|--------------------|
| 1000 mm = 1.0m | 90 mm = 0.09 m | 9 mm = 0.009 m |
| 900 mm = 0.9 m | 80 mm = 0.08 m | 8 mm = 0.008 m |
| 800 mm = 0.8 m | 70 mm = 0.07 m | 7 mm = 0.007 m |
| 700 mm = 0.7 m | 60 mm = 0.06 m | 6 mm = 0.006 m |
| 600 mm = 0.6 m | 50 mm = 0.05 m | 5 mm = 0.005 m |
| 500 mm = 0.5 m | 45 mm = 0.045 m | 4 mm = 0.004 m |
| 400 mm = 0.4 m | 40 mm = 0.04 m | 3 mm = 0.003 m |
| 300 mm = 0.3 m | 35 mm = 0.035 m | 2 mm = 0.002 m |
| 200 mm = 0.2 m | 30 mm = 0.03 m | 1 mm = 0.001 m |
| 100 mm = 0.1 m | 25 mm = 0.025 m | 0.5 mm = 0.0005 m |

2. How are linear measurements usually expressed in the building industry?

3. How do tradespeople usually talk about dimensions on site?

4. What are the names of the measuring tools most tradespeople carry on the site?

5. Describe the use these measuring tools are most suited for?

6. Write the following dimensions in metres:-

| | |
|-----------|-------|
| 55 637 mm | _____ |
| 10 005 mm | _____ |
| 17 108 mm | _____ |
| 6001 mm | _____ |
| 1273 mm | _____ |
| 87 mm | _____ |
| 3636 mm | _____ |
| 1097 mm | _____ |
| 707 mm | _____ |
| 6 mm | _____ |

Complete the following questions always showing the correct unit of measure after the answer

7. Add the following measurements:

- a) $5.35 + 0.345 + 11.5 =$ _____
- b) $27.457 + 0.004 + 3.32 =$ _____

8. Subtract the following measurements:

- a) $7.0005 - 0.456 =$ _____
- b) $345.450 - 15.01 =$ _____

9. Multiply the following measurements:

- a) $16.7 \times 5.433 =$ _____
- b) $45.00 \times 0.055 =$ _____

10. Divide the following measurements:

- a) $15.00 \div 0.5 =$ _____
- b) $72.40 \div 6.2 =$ _____

11. Calculate the area of a square with sides 4.5 m long

12. Calculate the perimeter of a square with sides 2.750 m long

13. Calculate the area of a rectangle 4.250 m long by 3.3 m wide

14. Calculate the perimeter of a rectangle with sides 17.5 m long by 6.25 m wide

15. Calculate the area of a parallelogram 4.65 m long and having a perpendicular height of 1.5 m

16. Calculate the perimeter of a parallelogram 5.520 m long with inclined sides 2.750 long

17. Calculate the area of a triangle with a base 16.6 m long and a perpendicular height of 3.2 m

18. Calculate the perimeter of a triangle with a base 4.5 m long and equal length sides of 3.650 m long

19. Calculate the circumference of a circle with a radius of 1.5 m

20. Calculate the area of a circle with a radius of 2.55 m

21. Calculate the volume of a cube with sides 2.5 m long

22. Calculate the surface area of a cube with sides 3.2 m long
